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CHRYSALIS
By CARL AKELEY

Courtesy West Side Unitarian Church, N. Y.

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Spencer and the Synthetic Philosophy

By Alexander Goldenweiser

In a sense Herbert Spencer rather than Darwin should be regarded as the father of Evolution. Under the sweep of his integrating intellect, the hypothesis of evolutionary development reached a comprehensiveness and a logical rigor which no one else either before or after Spencer was able to transcend or equal.

Brought up in a nonconformist family and possessed of an independent temperament, little Herbert, like many other eminent persons, was a bad boy. He did pretty much as he liked, studied what he chose, and neglected what he abhorred. Always he was an indifferent student, except in subjects that appealed to him.

Herbert Spencer

His early training, such as it was, fitted him for mathematical and mechanical work, and as a young man he spent some years as a railroad engineer. His thoughts, however, early turned to the two subjects to which the rest of his long life was to be devoted: evolution and the theory of politics or government. His article on the proper sphere of government in which Spencer laid down the principles of his political philosophy appeared as early as 1842 (when Spencer was twenty-two) and it contained all the basic thoughts later to be developed in his sociology and ethics.

Spencer was now in London, out of a job, and about to be introduced into a circle comprising some of the leading minds of the time. Having a rather delicate constitution and being a poor reader, Spencer hardly could have achieved what he did, if not for the stimulation he derived from the counsel and criticism of such figures as John Tyndall, the physicist, John Stuart Mill, Huxley, Hooker, George Eliot, and Lewis. The direct inspiration for his evolutionary theory, Spencer derived from Von Baer's work on embryology, Charles Lyell's contributions to geology, and Malthus's Essay on Population," which had inspired so many other notable achievements. Darwin influenced Spencer only indirectly, as the "Principles of Biology" had appeared before the publication of "The Origin of Species." When Darwin's book appeared, Spencer at once accepted the theory of natural selection as a striking formulation of the mechanism of biological evolution, and made it his own by incorporating it in the second edition of the "Biology."

But for Spencer, the world was a unity: evolution, if true in biology, had to apply to the entire cosmos. Thus we find that in his "First Principles," Spencer enunciated evolution as a universal process manifesting itself in the phenomena of inanimate matter, life, mind and society. This determined the scope of the synthetic philosophy which comprised the "Principles" of Biology, Psychology, Sociology, and Ethics. Unfortunately, the two volumes which were to deal with cosmology and geology remained unwritten, so that Spencer's ideas in these two domains must be gleaned from the schematic treatment in the "First Principles."

Spencer's "Biology" contains two important principles: 1. Individuation varies inversely with propagation, or the more an organism does for the race, the less is it able to do for itself; and 2. Acquired characters are inherited, meaning by this that physical or psychic traits acquired by an individual in the course of his life are transmissable to the offspring. Spencer was firmly convinced of the reality of this process and was willing to let the entire theory of evolution stand or fall on the issue. Either there was inheritance of acquired characters, he insisted, or there was no evolution. But when it came to proofs, Spencer was only able to present arguments. Of his protracted controversy with the German biologist, August Weismann, I shall tell in the next issue.

Spencer's "Sociology" in which he traces the evolution of political, ceremonial, industrial, military, and professional institutions, is notable for his sweeping utilization of the so-called comparative method which henceforth became the favorite operative tool of evolutionary writers. The essence of this method consisted in the accumulation of vast collections of data from many tribes and peoples at different times and places. These facts were then utilized to illustrate—or, as the evolutionists thought, prove the process of evolution in the history of human society. The principles the evolutionists were thus aiming to demonstrate were three: 1. civilization develops uniformly, meaning by this that it always passes through similar stages; 2. this development of civilization is gradual, meaning by this that sudden or conspicuous changes do not occur but that cultural change proceeds by slow and slight accumulation; and 3. the development of civilization is progres-

sive, meaning by this that it tends in the direction of improvement.

It is important to remember here that whereas the general validity of biological evolution is unquestioned, the existing differences of opinion referring merely to mechanisms and processes, the theory of social evolution as formulated by Herbert Spencer and in his wake by a host of anthropologists and sociologists, has not withstood further accumulation of data and the emergence of a critical attitude. At this time, all three principles of social evolution indicated above must be regarded as obsolete or, at best, inaccurate. For social evolution is neither uniform, nor always gradual, nor is it necessarily or even generally progressive. To this phase of the subject, I shall return in the last article of this series.

The outstanding contribution of Spencer's "Ethics" comprised in the main in his "Data of Ethics," "Social Statics," and "Man Versus the State," was his negativistic theory of government. An extreme individualist, both temperamentally and in theory, Spencer resented all infraction of individual freedom. Reluctantly, he was forced to admit that the full exercise of freedom by one individual inevitably conflicts with the equal freedom of other individuals. Here Spencer felt that a super-individual agency had to step in, so as to keep the exercise of freedom on the part of each within the bounds compatible with the freedom of all. Beyond this, no government should go. This theory, aptly designated by Huxley as "administrative nihilism," immediately became the center of animated discussion, and such it has remained to this day.

As one turns to Spencer's synthetic philosophy in the perspective of time one cannot but feel that whatever the errors and exaggerations of his over-ambitious scheme, he has earned once and for all a place of honor among those who have led man's thought into natural channels. Natural facts have natural causes. If these are known, the facts are understood. If they are unknown, they must be looked for.

The Nebraska Tooth

By HENSHAW WARD

THE fundamentalists are having a merry time over the episode of "the Nebraska tooth," and we should not begrudge them their fun. The little argument will last for years and will brighten up ten thousand anti-evolution speeches. But the real lesson of this affair will never be mentioned by the enemies of science.

About six years ago there was discovered in Nebraska a tooth that looked as if it had come from the skull of some primate. It was most carefully examined by three experts of the American Museum. They all agreed that the tooth had grown in the jaw of some early ape, called "sub-human." The Bulletin of the American Museum for February, 1925, declared with absolute confidence that no tooth had ever been more rigorously scrutinized and that "every suggestion made by scientific skeptics had been weighed and found wanting." The tooth was made the basis for naming a new genus and species of anthropoid, *Hesperopithecus haroldcookii*, in honor of the finder, Harold J. Cook.

Henry Fairfield Osborn considered the tooth so important and so well authenticated that he spoke of it thus in his book, *The Earth Speaks to Bryan*, 1925: "The Earth spoke to Bryan from his own native state of Nebraska, in the message of a diminutive tooth, the herald of our knowledge of anthropoid apes in America. This tooth is like the 'still small voice.' . . . This little tooth speaks volumes of truth. . . . This bit of truth constitutes irrefutable evidence that the man-apes wandered over from Asia into North America." The newspapers accepted the judgment of the greatest paleontologists and poured upon Bryan a great deal of ridicule for denying the evidence that had been found in his own state.

But on February 19, 1928, Wm. K. Gregory, of the American Museum, gave out to the press a statement that the paleontologists had probably been mistaken. He reported that further investigations in Nebraska had shown the probability that the tooth was not anthropoid at all, but belonged to an extinct peccary, a pig-like animal. He retracted completely his former judgment of five years' standing. He announced his error, knowing full well the scorn and ridicule that he would bring upon himself from anti-science orators.

Thus a dreadful blunder was exposed. If ever Dame Science had cause to blush for the rashness of one of her followers, she had it then. John Roach Straton was inspired to real wit by this gruesome revelation; all the cohorts of fundamentalists shouted for joy, and will continue to rejoice as the years go by. They have a right to be happy.

And the louder they are in mirth the more they will advertise that they do not understand what mental integrity is, nor what nobility of soul is. When Gregory proclaimed his mistake, he was doing the finest sort of act that human beings can aspire to. He was showing the world that science will not tolerate pride or hypocrisy. A scientist who palters with truth is infamous. A scientist must declare the truth as he finds it, even to his own hurt, and spare not. In all the rhetoric of fundamentalism there is not a fraction of the nobility of soul that has been shown by the episode of "the Nebraska tooth."

The strength of the evolution theory is in this very fact that at all stages of its development it has been subjected to the most severe tests, that errors by biologists have been unflinchingly proclaimed, and that the theory has thus been purged of misconceptions. The sternest critics of the theory are the men who make it.

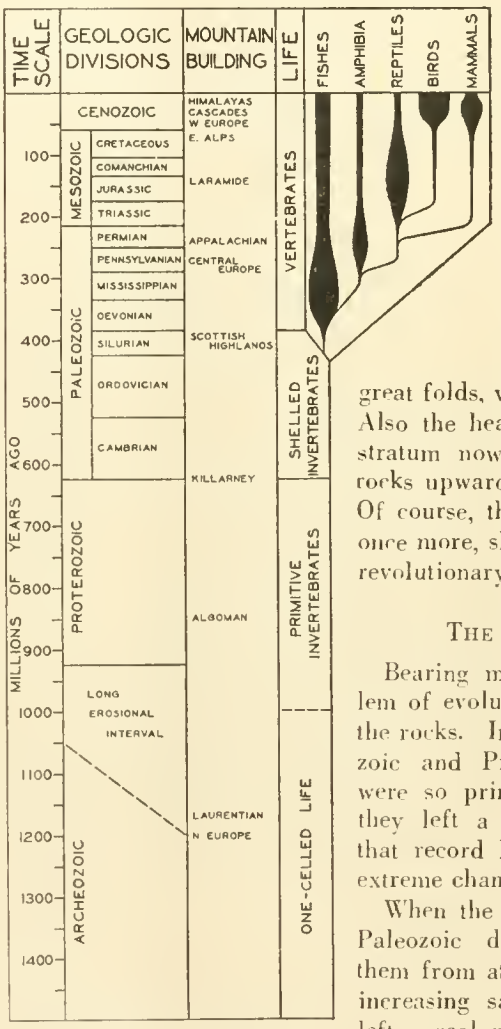
How Old Is the World?

By Allan Strong Broms

RECENTLY published scientific measurements of the age of the earth increase rather than decrease the hundreds of millions of years since the formation of the earliest known rocks. In the accompanying diagram the consensus of conservative geological opinion is shown. The oldest known rocks are given an age of 1,500 million years, but the actual figure may be as great as four billion.

The most trustworthy means of determining the ages of the rocks is the uranium-lead method, already described in the February issue of Evolution. We know the rate at which the radio-active mineral uranium breaks down into lead. By measuring the relative amounts of uranium and of lead in a given rock, we can fix its age very closely by a simple computation. The conservative results (tabulated by Joseph Barrell) are shown in the diagram.

The figures of the time scale are given in millions of years. Read it from the bottom up, from the earliest geologic eras upward to the present, that being the order in which the various rock strata have been laid down.



Geological Time-table

The Geologic Divisions

Five great geologic eras are shown. The Cenozoic (most recent) is relatively so short that there is no room for showing its subdivisions, which in order of time are: Eocene, Oligocene, Miocene, Pliocene, Pleistocene (Glacial Period) and Recent periods. The Mesozoic and Paleozoic eras are shown fully subdivided into periods, but the subdivisions of the earlier Proterozoic and Archeozoic eras are variously classified and are, accordingly, not shown here. Between these two earliest eras occurs a great geologic gap, during which the entire geologic record was wiped out by erosion. We know little about it other than its great, though uncertain, length.

Periods of Mountain Building

Without going into details, the great recorded periods of mountain building are indicated. Only the Cenozoic mountains are still high and jagged, *i. e.*, young in the geologic sense. Even such recently built ranges as the Appalachian show the signs of wear, their tops being well worn down and rounded. Many of the earliest ranges have been completely leveled by the age-long erosional forces.

It will be noted that the great periods of mountain building are spaced at fairly regular intervals. This indicates a cycle in geologic forces and accords very well with Professor Joly's theory of geologic revolutions described in the April issue of Evolution, except that his estimates of the time between revolutions appear too short. But this does not argue against his theory at all. He holds that the heat from radioactivity slowly accumulates within the earth, eventually melts the substratum and the thinner crustal rocks. By expansion the substratum forces the crust as a whole outward and yet permits the mountainous areas of the crust to sink deeper into its own less dense substance. As portions of the earth crust are melted thinner, a rapid cooling, solidifying and shrinking of the substratum occurs. As the crust settles upon the shrunken interior, it wrinkles into great folds, valleys and mountain ranges. Also the heavier (because cooled) substratum now forces the lighter crustal rocks upward as great mountain ranges. Of course, the heat accumulation begins once more, slowly preparing for the next revolutionary cycle.

The Evolution of Life

Bearing most closely upon the problem of evolution is the record of life in the rocks. In the first two eras (Archeozoic and Proterozoic) the life forms were so primitive and soft-bodied that they left a very doubtful record, and that record largely erased by long and extreme changes.

When the simple sea life of the early Paleozoic developed shells protecting them from attack, and perhaps from the increasing saltness of the oceans, they left a real record that would stand the wear and tear of time. From their evolutionary progression we can now classify and correlate quite definitely the several geologic periods of this and more recent eras.

By the middle of the Paleozoic, fishes, the first backboned animals, appeared. Towards its end, the amphibia (frogs, salamanders and newts being modern representatives) took the very important step from water to land and developed lungs.

The Mesozoic Era is dominated by the reptiles, which culminated in the great land and sea lizards, the dinosaurs, most amazing of our museum pieces. They were not as large as our whales, but they were built with much bulk and brawn, though with hardly any brains.

After a long preliminary development, the birds and mammals (both warm-blooded and brainy) rose rapidly to their present world mastery during the Cenozoic era. Man is one of the mammals (hair-covered and milk-nursed) and can trace his ancestry quite clearly over the few hundred thousands of years of his evolution. His span of existence on this earth has been most brief as earth history goes, being represented by less than the thickness of the top line of the diagram. But in this short time he has won rulership over the world and that solely by his wits. That is a record of which even a fundamentalist should see fit to be proud. Whether we are proud of it or not, that is the record, and it does hold the promise that, as he has done great things in the past, man shall do greater in the future.

It Is Up To Man

By George A. Dorsey

THE Smith-family-Robinson are ashore for a picnic on an island never before trod by Man. All go in for a swim. A tidal wave picks them up and drops them far inland, leaving no trace of boat, ship, or anything but the scant whatever they had on. The shock robs them of all memory of past life. They do not even remember their own names.

Once Man was like that. Nature had made him, but Man himself had not made anything. All that he has made since is culture.

Man made culture because culture seemed the easiest way to satisfy a force within. This force was the joy of life, the love to live. It drove him to get on, to try to make life more secure, to rise above and become less dependent upon physical surroundings; to postpone, to cheat, death.

He improved his lot. One thing led to another. Meanwhile he talked the situation over with his mate, parents, children, friends. One word led to another—a new word for each new tool, for every new situation. He invented a language—many languages.

Customs became established into rules for living together, rules for family life, rules to govern the group. He invented Heads of houses, Chiefs of tribes, Priests of religion—for he early took to religion.

He so loved life and had so little confidence in his own power that he sought power everywhere—in stones, in rivers, in trees, from the Serpent, from the Eagle, from Sun, Moon, and Stars. He peopled his world with ghosts—propitiated those he feared, cajoled those he hated. Anything to get more power—power over foes, over dangers, over forces, over life, over death.

He would cheat death. He would make life more secure, more stable. The quest for life led him a merry chase. It leads us a merry chase. It might be so much merrier.

Man must eat, drink, and be married—or he dies and leaves no mourners. It almost looks like a vicious circle. In a way it is—in this way: we always get back to the nature of the beast, to human nature, to the nature of life. Nature does not "believe" in civilization, vote the Republican ticket, or set kings on or off thrones. Nature is interested in food and sleep, legs and livers, and babies. Nor does she care what or when we eat—only that we get enough of certain foods; nor with whom we mate—only that we propagate our kind.

Life is simple. It is Man that is complex—complex in the vast and intricate machinery he has devised to satisfy Life's simple demands. Wonderful machinery—but are we always certain we know what it is all about, what it does to us, whether we fit into it, whether it fits us?

This machinery is Man-made, "artificial"—it has a history. Man is a product of Nature, "natural"—Man has a history. The two histories are not the same. One is millions of years long, the other but a few weeks as time flies. One begins where the other leaves off. One is Nature, the other is culture. Culture takes a thousand forms and goes by many names. Its forms change and often have but little relation to the work they were asked to do. The work to be done is always the same: satisfy Man's love of life and need for love. Culture is handed down to us from loving hands—it is our patrimony. Often we do not see it, we just accept it with child-like faith, assuming that it is what we want, what we need, all that we can get. We lean on it to get us food and sleep and rest and immortality. We count on it for support, as our ancestors counted on the spirits they propitiated with food and wine. We even throw a halo over it, venerate it, sanctify it. Or, we try to improve it, not knowing what we try to improve, not realizing that Man is of more value than custom or law.

Culture is the means to the ends of life. The ends are rooted in our natural inheritance. The understanding of that inheritance is the key to human culture; without that key we cannot unlock the chests of our social patrimony, nor separate the gold from the base metal of our lives.

ATOMS IN EVOLUTION

At the April meeting of the American Chemical Society in Washington, the assembled scientists saw photographs of atoms in process of reconstruction taken by Professor William D. Harkins of the University of Chicago and heard Dr. R. A. Millikan describe the creation of common elements through the action of his newly discovered "cosmic rays". The pictures showed "the synthesis of an atom, since a helium atom is striking a nitrogen atom and forms a heavier oxygen atom and a higher hydrogen atom." "Whether all this atom building and changing indicates a universe that is building all the time or is being steadily destroyed, as the older school of philosophy had it, is still in doubt. It builds in some places and tears down in others; it may remain in status quo."

Why Amoeba Behaves

By Cleveland Sylvester Simkins

THOSE minute organisms that live on the border line of naked vision as independent cells have within their structure a reaction system which at first blush seems purposeful, but which is seen to be controlled entirely by the known laws of biochemistry when examined more closely in the light of present advanced knowledge.

It was natural enough that early students of these simple life forms should have imputed to them a sort of intelligence similar to that of man, a sort of primitive soul, and insisted that they are controlled by sensations of pleasure and pain such as determine human behavior.

The amoeba is a naked bit of protoplasm. Protoplasm is complex in chemical make-up, varies in physical consistency from instant to instant, and possesses various substances whose specific gravity differs in different parts of the same cell. The surface of the protoplasm is a jelly-like membrane, while the inner material is more of a liquid. Yet this inner material may take on the same character as the surface membrane; it may become jelly-like under appropriate conditions. Within the cell the jelly and fluid states alternate. Neither is constant.

When any part of the interior protoplasm jells it shrinks, thereby producing pressure and heat, tending to convert the jelly into fluid again. These two reversible processes, known as gelation and solation, are self-regulative and unstably balanced as long as the animal remains alive. A little shove one way or the other upsets the balance, and solation goes on until it checks itself and gelation begins.

Is This Behaving?

The outer surface of the amoeba will not mix with water. Thus there exists an interface between the animal's body and the medium in which it lives. This is controlled by surface tension, not only on the outer surface but also inside the protoplasmic mass, since surface tension develops wherever media of different densities come in contact with each other. Hence, the interior of the cell is subjected to interfacial forces that are changed by every activity,—digestion, absorption, assimilation.

Both jelly and fluid are made up of molecules that have their own interfacial forces and surface films, which when distorted or influenced by any disturbance whatever, start a series of changes that effect a reaction in the organism as a whole. Any change in one part of the system will make itself felt in the more remote parts. Thus the very process of life and the succession of events supplies its own stimulus to behavior.

The series of cause and effect leads unmistakably into a reaction which the organism can not escape. It is forced to react by the very nature of its chemical and physical constitution. For example, if ultra-violet light is thrown upon one side of an amoeba, the protoplasm on that side is jelled, shrinkage occurs, the internal fields of force are distorted, the increased pressure induces solation on the other side, the softening substance flows outward and the remainder of the organism flows after it, thus moving away from the stimulus.

The forces underlying these changes reside in the surface films of the colloidal particles, the stimulus of the radiation disrupts them. This in turn disrupts the balance of the interfacial forces of so large an area that a shifting of positions, substances and forces takes place to attain a new stability. The various phases of form and motion are caused by changes in the surface tension. They constantly vary as affected by environment.

She Learns Little

The length of time any given phase endures depends on the intensity of the stimulus which threw the colloids into that phase. A very strong reaction caused by actual contact with some noxious chemical will throw the surface into a jelly state that persists for some time. During this time everything encountered by the amoeba, even food particles, will be rejected. If, on the other hand, the previous experience of the organism has caused a fluid or receptive phase in the surface jell the formerly rejected particles will now be engulfed. This behavior has been cited as proof that the organism exercises a power of discrimination between two particles and chooses one or the other.

But these reactions of the amoeba to its environment do not indicate choice on the basis of pleasure or pain, nor of a primitive intelligence that chooses between two particles as an incipient sense of taste, any more than a drop of water placed upon a particle of glass and salt would choose the salt in preference to the glass. When we consider the behavior of amoeba in the light of modern colloidal chemistry, the ability to select becomes less significant as a criterion of living things. Selection does depend upon the previous experience of the organism. A series of reactions that set up a certain phase endures for a time, during which the attitude of the organism toward all things is the same, regardless of their food value. This phase soon changes, due to the instability of the protoplasm. This duration of a certain phase may be the germ of retention, which by repetition becomes established as a basic property of protoplasm and serves as the commencement of that higher, psychic process known as memory.

Lacks Will Power

The ability to react upon the experience of the past is a fleeting one at its highest development. In man it endures for varying lengths of time, in amoeba it endures but a moment. There is no scientific evidence available that puts us under the least obligation to explain the behavior of the amoeba as manifestations of taste, will, choice or skill, nor should we think of it as capable of forming habits. Its reactions are forced movements, determined by the intensity, character and continuation of the stimuli to which it is subject at the moment. Any so-called selective ability in the amoeba cannot fairly be called "microscopic mentality" or psychic ability", nor can isolated instances in its activity,

like capturing prey, be considered as purposeful or designed, since the fundamental stimulus to activity results from an attempt to regain a disrupted balance.

Behaves Because She Must

If the behavior of amoeba depends upon the mechanism of its elemental substance and the mechanical arrangement of its forces, where lies the evidence for a psychic state? When we assume a "psychic state" in the amoeba, we are merely projecting our own mental experiences into it. The fact that amoeba performs all the physiological acts of the higher forms leads one to believe, *a priori*, that some sort of volition influences its reactions, but when the physio-chemical structure of its body is kept in mind, no element of the entire reaction system presents factors that lie beyond the reach of objective science, unless it be in the vastly more complicated and delicately adjusted balance that obtains in a living colloidal suspension. It is true that all the adjustments of the living cell are too subtle to have yet been observed by the human eye. However, the ability of the human brain to analyze the structure of all things that live increases at an uncanny rate. So we may look forward to the time when we can write the chemical formula that expresses the phenomenon of life.

The only psychic state which the amoeba has may be said to be the duration of the effect of a given stimulus, a holding over into the future of an effect of the past, a capacity which tends to become fixed through repetition, which develops with a neuromotor system, is bequeathed to progeny, evolves, comes to reside as nascent memory in special nervous organs and culminates in the baffling mental life of man.

Man's Fossil History

By Hugh F. Munro

BONE for bone, and organ for organ, man is one of the higher mammals.

His body is made up of the same number of systems (osseous, muscular, digestive, nervous, etc.) as is that of the animal and is arranged in the same manner and performs the same functions. Like the animal, his individual history begins in a single cell. He is nourished, grows, reproduces and dies as do the animals. Within their limited scope in the animal, he is assailed by the same diseases and is cured by the same remedies. He is fatigued by exertion, as they are, and he requires periodical rest as they do; in fact, every one of his vital processes has its exact counterpart in any one of the higher mammals. It is, however, one thing to say that he in general represents the animals, but it is quite another to prove that he is related to them by descent. It is now generally agreed that his immediate progenitor is not to be found in any of the existing anthropoid forms, but that he and they have developed from an ancestor common to them both, and his comparatively late advent in geological time would lead us to expect that here again intermediate forms could be found; and they have been so found.

In Asia the most primitive body of the human line or the most human like body of the ape line is represented by the fossil remains of the ape-man Pithecanthropus Erectus found by Dubois in 1891, in an early Pleistocene deposit at Trinil, Java. As was to be expected, the cranial capacity of this fossil shows a stage more advanced than that of the ape, but less than that of man. The volume of the brain cavity (between 850 and 950 cc.) indicates a brain of about 28 ounces in weight; the forehead was more receding than in the modern chimpanzee. As the maximum brain capacity of the gorilla is only about 20 ounces (in volume between 500 and 600 cc.) and the average human brain weighs about 49 ounces (1450 to 1550 cc.) and the smallest normal brain of living man is probably never less than 30 ounces, it is clear that the brain capacity of Pithecanthropus is more than halfway between that of the ape and of man.

The most conservative estimate of the lapse of time since the Pithecanthropus places it at about half a million years ago. The next oldest human remains were found in 1907 in some river deposits at Mauer, near Heidelberg, in Baden. The specimen comprises only the lower jaw with all of its teeth, yet it displays a combination of characters not found in any other specimen, living or fossil. There is no chin prominence and the shape of the whole jaw is more like that of a large ape, yet the teeth are distinctly human. It was found associated with a large number of fossils of animals now extinct, which enables the life date to be placed at the second inter-glacial period or 350,000 years ago. Other fossil remains possessing more or less clearly defined animal and human characteristics are the Neanderthal, the Piltdown, and about half a dozen unnamed specimens discovered in various parts of the world. In semi-desert Bechuanaland, South Africa, Prof. Raymond A. Dart, of the Witwatersand University, has discovered an almost perfect fossil skull of a type intermediate between the living anthropoid apes and man. The new fossil has been named Australopithecus Africanus, but it will probably be known as the Faungo skull, from the name of the community near where it was found. Geologists place the life date of this skull as some time during the middle part of the Tertiary period, probably in the late Miocene or the early Pliocene epoch. This period, on a conservative estimate, is from two to three million years ago, making it the most primitive human fossil so far discovered. The *Scientific American* of May, 1925, gives a very complete and illustrated description of this fossil, and comments as follows on the discovery: "Thus is another part of the gap between man and his simian ancestor filled in by an additional 'missing link.' Thus is Darwin's prediction that the direct ancestor of man when found would prove to be some form of forest-dwelling ape tied up tighter with tangible evidence. Thus does the theory of evolution as applied to man receive another and a weighty vindication."

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A PERNICIOUS PRACTICE

To curry favor with fundamentalist text book commissions certain publishers print special editions of their school books, leaving out any mention of evolution.

We can respect the fundamentalists. Many of them act according to their lights. They simply don't know any better. They at least believe that they are acting in the best interests of the growing generation, that they are safeguarding their children from what they consider dangerous doctrine, when they advocate and enforce anti-evolution laws.

But we can not respect publishers that deliberately put out misleading texts for the sake of "business", nor pussy-footing authors that are willing to cash in on these deplorable prejudices by lending their names to books that feed the growing mind on mere husks instead of the solid grain of truth.

EVOLUTION is investigating this entire situation, and expects to make a report in an early issue that will jar the smug complacency of those guilty of this pernicious practice. We invite our readers to co-operate by bringing to our attention any specific instances of which they may be aware.

THREE MARTYRS TO SCIENCE

In quick succession, three eminent scientists of the Rockefeller Institute have given their lives in defence of humanity against the dread tropic disease, yellow fever. They are Professor Adrian Stokes of London University, the Japanese Doctor Hideyo Noguchi and Doctor William Alexander Young who all died of the disease they were fighting. Working at Accra, on the African Gold Coast, they had already isolated the germ of the disease and were on the verge of success in their search for a cure. Records they have left of their discoveries and progress will permit the completion of the work of these heroes of science who gladly made the supreme sacrifice that mankind might be freed from another great scourge.

IT'S IN THE POINT OF VIEW

The Professor said to the protoplasm:
"Truly, there is a mighty chasm
Between the two of us, my friend,
You the beginning, I the end."

The protoplasm made reply,
Winking his non-existent eye,
"Since I've been watching you, old man,
I'm rather sorry I began."

Author Unknown

EVOLUTION FOR FARM ANIMALS

In the March issue of EVOLUTION, we reprinted an abstract of the work done by Dr. H. J. Muller of the University of Texas in speeding up variation in fruit flies by exposing them to X-rays. Now comes the announcement from Leo J. Brosemer of Chicago, nationally known authority on scientific stock breeding and formerly junior animal husbandryman in the U. S. Department of Agriculture, that, with the help of other scientists, he is beginning a series of experiments on the application of the same method to the large, slow breeding animals of the farm. Sensational things are looked for when the rays are applied to cattle, pigs, poultry, wheat and other farm subjects and he hopes to do as much in three or four years as breeders have heretofore been able to do in a century.

IN ENLIGHTENED NEW ENGLAND

The press reports that in Manchester, N. H., the Board of Education bars books mentioning evolution, for the reason that "as long as we have to omit the teaching of religion in the schools, there is no reason why we should open the door to this scientific theory."

TEACHERS IN TROUBLE

Teachers who have difficulties because of teaching about evolution are invited to communicate the facts to this journal.

HOW TO WORD A WILL

One of our friends writes: "I do not intend to die soon, but in case of accident I should have a will made favoring EVOLUTION. Can you tell me the right way to proceed?"

Simply incorporate in your will the following: "I give, devise and bequeath ..... dollars to the Evolution Publishing Corporation, a corporation organized and existing under the laws of the State of New York, or its successors."

NOTICE TO SUBSCRIBERS

Since EVOLUTION did not appear for May and June, all subscriptions will be extended two months. The year will include twelve numbers.

IF YOU CHANGE YOUR ADDRESS

for the summer, be sure to notify us, giving your old as well as the new address. And, of course, try to send us a few new subscribers at the same time.

ANOTHER CHANCE FOR CRUSADERS

By JOSEPH MCCABE

IT is just about three centuries since one of the most gifted of Englishmen, Lord Francis Bacon, turned aside from his more ponderous work to pen a little utopian sketch called "The New Atlantis."

Bacon's Utopia is unlike any of the others. The general character of the others was that they cut down the hours of labor yet miraculously increased the production of wealth. They always forgot to tell the secret of the increased production. Bacon, with magnificent foresight, saw that science was going to prove this source of enrichment. His main idea that each State should have a wonderful central College of Science, the various national colleges communicating freely with each other, and wealth and progress would be ensured.

Science was extremely rudimentary in his day, thanks to the philosophers and theologians who uplift us with their spiritual realities, yet Bacon's genius dimly described the glorious promise of the future in the rudimentary principles. Writers who try to belittle Francis Bacon point out how vague his language was. Naturally. Let them try to tell what the chemist or the electrician will be doing three centuries from now. The fact is that, with a necessary haziness, Bacon foresaw the vast cold storage of modern times, the vehicles that would run along without horses, or would rise into the air or travel below the surface of the sea, and so on.

People smiled, of course. Fantastic idea, this, that you should look for the higher welfare of the community to a bunch of men who gazed at the stars through "optic tubes", or "nosed around the stinks of a laboratory" (as the Catholic G. K. Chesterton elegantly puts it) when there were so many brilliant statesmen, able merchant-adventurers and eloquent preachers to take care of it. Literary men and artists turned up their fine-cut nostrils and worked out neat little epigrams about science. Spiritual writers assured the world that only neglect of the higher and more precious things of life would ensue from this materialistic trust in science.

So the world had to wait two more centuries for the partial redemption that we have witnessed in modern times. Men of science meantime worked on in silence and under general disdain until the world found that they could invent machines to do the work of a hundred horses and find the power to run them. But when these men of science went on to announce the truth of evolution all the old bitterness was revived. That is a familiar story. It would sound like an episode of the New Stone Age if there were not Rip van Winkles amongst us who have just awakened.

The other day I conducted a Catholic lady around Westminster Abbey, the greatest of the old churches of England, the

incarnation of its religious spirit. I maneuvered her quietly to a certain corner of the wonderful and beautiful Valhalla of the English nation, and then, as she gazed around, told her to read the brass lettering which told on whose grave she was standing. Charles Darwin!

The day will come when men will raise one of the most superb monuments in the British national mausoleum to Darwin, and pilgrims from all parts of the world will seek that obscure tomb, over which the echoes of psalms and hymns still roll daily. Darwin not only opened a new age for science: he opened up a new and splendid vista for men.

* * *

Everything that is, Evolution says, will pass away. It is, as a rule, a stage to higher things. "Everything flows" was the two-word summary of the teaching of a certain Greek philosopher two thousand years ago. There are many things that we want to see flowing into the oblivion of the Middle Ages. But nature is slow: or, rather, it has reached the stage when its finest agencies are the thoughts and sentiments of man. Flowing is not now good enough. We want something more rapid. A large and vigorous minority in any civilization could sweep away all these dark old reactionary forces in a few years. Timid compromise with them is useless. They have assured me that they despise it. This will probably be the last chance of crusaders for the merry work of fighting dragons.

A CLERICAL JUGGLER

By EDWIN TENNEY BREWSTER

NOTHING more amazes the simple layman, in all this Anti-Evolution fracas, than the fashion in which the clergy juggle their verbal formulas quite regardless of the obvious facts of nature. Byron C. Nelson, D. D., for example (*Bible Champion*, Dec., 1927, p. 640) regards it as "the strongest reason for rejecting evolution" that:

"Mendelism teaches that the various forms, *i.e.*, shapes, colors, and other physical characteristics of living organisms are produced by the presence in species of certain things called 'factors.' (Of course, Mendelism does nothing of the sort.) These factors descend in the germ plasm from generation to generation, and, as far as is known, they cannot be destroyed without the destruction of the offspring, neither can they be altered."

Or in other words, according to the Reverend Byron C. Nelson, D. D., there can never be an albino. Normal men have a "factor" for skin pigment. If that is "destroyed," that is the end of that creature. Neither can there be a white kitten or a white rose. You think you see them, but you don't! Moreover Burbank's spineless cactus was just another scientific fraud; and alleged "hornless" breeds of cattle really have invisible horns. For the "factor" for spines or horns cannot drop out "without the destruction of the offspring." Moreover, since "factors" cannot be altered, there are really no Baldwin apples, no Concord grapes, no golden bantam sweet-corn, no pink roses, no long-haired or tailless cats, no six-fingered men, nor any of the thousand-and-one "mutants" that we laymen deceive ourselves into thinking that we see!

Truly, theology is a wonderful science!

"Not merely what we do, but what we try to do and why, interprets what we are." A. Nielen.

"Ideals are like stars. You will not succeed in touching them with your hands, but like the sea-faring man on the desert of waters, you choose them as your guides, and following them, you reach your destiny." Carl Schurz.

Anti-Evolution Law Proposed In Arkansas

IN Arkansas the fundamentalists are trying out a new tactic this year in their war upon the teaching of evolution. They will submit the question to popular vote at the next election. The provisions of the initiative and referendum law furnish them the opportunity to do this. If eight per cent of the voters sign a petition requesting it, any proposition has to be printed on the ballot and submitted for decision to all the voters at the next regular election. So the fundamentalists have got the brilliant idea of appealing directly to the people, and settling this question of science by popular majority vote.

Already two months ago they boasted that they had over 20,000 signatures to their petition, nearly twice the number required by law, but they have not yet filed it. A. L. Rotenberry, one of the sponsors of the bill, frankly admits that he is waiting until July to file the bill so that the campaign may be shortened and the evolutionists have less time for their educational campaign.

The full text of the petition sponsored by the Arkansas Anti-Evolution League and the American Anti-Evolution Association, is as follows:

INITIATIVE PETITION

To the Honorable Jim B. Higgins,
Secretary of the State of Arkansas:

We, the undersigned legal voters of the State of Arkansas, respectfully propose the following law, to-wit:

Act No.....

FOR AN ACT TO BE ENTITLED "AN ACT TO PROHIBIT IN ANY UNIVERSITY, NORMAL, PUBLIC SCHOOL, COLLEGE OR OTHER EDUCATIONAL INSTITUTION IN THE STATE OF ARKANSAS THAT IS SUPPORTED IN WHOLE OR IN PART, FROM PUBLIC FUNDS, THE TEACHING THAT MAN DESCENDED OR ASCENDED FROM LOWER ORDER OF ANIMALS AND PROVIDING A PENALTY FOR VIOLATION THEREOF."

Be It Enacted by the People of the State of Arkansas.

Section 1. That it shall be unlawful for any teacher or other instructor in any University, College, Normal, Public School, or other institution of the State, which is supported in whole or in part from public funds derived by State or local taxation to teach the Theory or Doctrine that mankind ascended or descended from a lower order of animals and also it shall be unlawful for any teacher, textbook commission, or other authority exercising the power to select textbooks for above mentioned educational institutions to adopt or use in any such Institution a textbook that teaches the doctrine or theory that mankind descended or ascended from a lower order of animals.

Section 2. Be it further enacted, that any teacher or other instructor or textbook commissioner who is found guilty of violation of this Act by teaching the theory or doctrine mentioned in Section 1 hereof, or by using, or adopting any such textbooks in any such educational institution shall be guilty of a misdemeanor and upon conviction shall be fined not exceeding five hundred dollars ($500.00); and upon conviction shall vacate the position thus held in any educational institutions of the character above mentioned or any commission of which he may be a member.

Section 3. This Act shall be in full force and effect from and after its adoption by vote of the people of the State of Arkansas.

Section 4. That all laws and parts of laws in conflict herewith be, and the same are, hereby repealed.

And by this, our petition, order that the same be submitted to the people of said State, to the end that the same may be adopted, enacted, or rejected by the vote of the legal voters of said State at the regular general election to be held in said State on the 6th day of November, 1928, and each of us for himself says:

"I have personally signed this petition; I am a legal voter of the State of Arkansas, and my residence, postoffice address, and voting precint are correctly written after my name."

The Present War Against Evolution

(Part of a radio talk given over KFRC, San Francisco, on March 29)

By MAYNARD SHIPLEY

SINCE they have met defeat in a number of State legislatures the enemies of science have determined "to carry the question of evolution to the plain people." In other words, since they can not get educated men and women to approve their activities, they are going to appeal directly to the mass of the electorate, which, engrossed in other duties, has had little opportunity to judge questions of science. Their first experiment of this kind is being carried on in Arkansas.

Here Representative A. L. Rotenberry, backed by a Fundamentalist evangelist named Ben Bogart, has prepared a very stringent measure, which if passed, will even cripple the medical schools of the State and make it difficult to teach geology and biology even in the State University. This bill is being presented to the voters of Arkansas to be voted upon at the November election.

NEW ATTACKS PLANNED

If the fundamentalists succeed in Arkansas they will approach every one of the twenty States which have the initiative and referendum system in the same manner. Specifically named as the next points of attack are North Dakota, Colorado and Montana.

But this does not mean that the fundamentalist anti-evolutionists are now going to confine their attention to initiative measures. Far from it! They have eloquent, if not learned, speakers at the present moment spreading misconceptions of scientific findings and ridicule of science in Kansas and Oklahoma, which they announce will be the first states to face anti-evolution legislation in 1929. Not one of these states—Colorado, Montana, North Dakota, Kansas and Oklahoma—is in the South, where the agitation against the teaching of evolution began. The anti-scientists are spreading their net also over the north and west. Indeed, last year anti-evolution bills were introduced in two New England States—Maine and New Hampshire—to say nothing of the bill which we managed to defeat in California.

While Bryan was alive only one or two such bills were introduced in any one year, and only in the south. Now, three years after his death, under the leadership of such men as Straton and Riley, anti-evolution measures are introduced in the north and west, and in 1927 thirteen of them! They are the entering wedge, and we shall see strange sights in 1929.

MORE FUNDAMENTALIST TRICKS

Meanwhile, the general non-legislative war on the teaching of evolutionary science goes merrily on. Tennessee and Mississippi have state laws forbidding the teaching of evolution. In Texas the State Text Book Commission simply deleted from authorized text-books those passages which taught or even implied evolution, and nationally known school book publishers are now getting out so-called "Texas editions". This system has been extended to Louisiana and Florida by consent of public school officials who are "more interested in the next election than in the next generation."

In Florida, at this very moment a self-appointed committee of Fundamentalist Baptist deacons headed by a Fundamentalist Presbyterian elder is engaged in what they call "purging" the libraries of the State University and the State College for Women of books of which they do not approve. The chief objection as voiced by Elder Tatum is that they contain evolutionary teachings.

Moreover not a week passes that I do not receive a letter from some teacher complaining that he or she has been dismissed for teaching evolution and even, in many cases, for believing in it. One was from a history teacher in the enlightened state of Michigan, who was repeatedly asked specifically if he accepted the theory of evolution!

And yet there is not a living biologist or geologist of standing today who is not an evolutionist. As the late President Woodrow Wilson put it, when questioned during the Scopes trial: "I, like every other man of education and culture, naturally accept the theory of evolution."

THE BASIC ISSUE

The conflict is between two opposing cultures, two irreconcilable views of the world and of life. It can not end in a "peace without victory", but must continue until one prevails. There is the method of science, and there is the method of tradition, and every serious-minded man and woman must choose between them.

The method of science is that of observation of facts, of testing, weighing, measuring, comparing, analyzing, synthesizing. The method of tradition is that of hearsay, of handed down ideas, of so-called revelation from an alleged supernatural source. That is the method of the darkest era of man's history, when men trembled at thunderstorms and earthquakes; when there was a witch or a demon in every accident, and the only way to avert an epidemic or the evil influence of a comet in the skies was to burn candles or chant hymns or to burn the witch or torture the wizard to death.

That, it should be plain even to the most prejudiced, is not the way of the twentieth century. Today when an epidemic occurs we study its causes and cures, we work to prevent its repetition. In a thousand laboratories patient toilers are at work saying "why did this happen and how can we make certain that it will not happen again?" That is the way the Panama Canal was built—by sanitation, the destruction of the mosquitoes that caused the fatal malaria which had made engineering impossible. In the sixth or seventh century the malaria would have been approached by exorcism and prayer; and the Canal could not have been built. The monumental work that has removed the menace of yellow fever and bubonic plague from America; that increases the output of our fields a hundred fold; that lights our houses by electricity and provides the very radio over which the obscurantist mouths his ancient errors and the aeroplane by which he flies to spread his old mythologies;—all this is due to the patient investigation, the laborious toil, the strict logical reasoning of the modern scientists. And among these scientists you will not find one who has any standing among his fellows who does not accept evolution as a matter of course.

To paraphrase the striking words of Professor W. D. Mathew, of the University of California, evolution is no more a theory to the man who has studied present day science than the city of San Francisco is a theory to the man who lives in it. It is an established and incontrovertible fact.

LET KNOWLEDGE JUDGE

Some portions of some of our narrower religious sects desire to cast this fact aside and substitute for it the guesses and imaginings of people who lived long before the present era of enlightenment. Incapable of understanding the discoveries of science, they have set themselves up as arbiters of what they can not comprehend, and as better judges of delicate questions of science than the men and

Courtesy of Stephen C. Preston

A NEW STYLE IN ROOSTERS

Here's photo of a Plymouth Rock Rooster with a pair of horns atop his head. He's on exhibition at a gasoline filling station in Oregon City, Oregon. Seems hale and hearty, and gleefully grows a new horn when one of them breaks off in the wire netting of his cage.

It will be interesting to note whether this rooster becomes the ancestor of a new race of Horned Chickens. At any rate, he should be of interest to scientists investigating the knotty problems connected with the sudden emergence of entirely new characteristics.

women who have given their lives to its study.

When we want a bridge built, we go to a bridge builder; when we are planning a home, we go to an architect; when our teeth ache, we go to a dentist; when we have legal difficulties, we go to a lawyer. Similarly, when we are confronted by questions of science, we should go to the workers in and teachers of science, and not to those who know nothing of it.

If you believe that questions of science should be settled by experts in science, we need your co-operation in this increasingly urgent struggle. A note to the Science League of America, 504 Gillette Building, San Francisco—our national headquarters—will bring you an informative leaflet and an application blank.

LISTEN IN ON WEVD JULY TENTH

From 9:35 to 10 o'clock Tuesday evening, July 10th, Dr. Alexander Goldenweiser will broadcast through station WEVD, New York, on the subject: "What the Fundamentalists Are Doing."

Readers of EVOLUTION, who have been following Doctor Goldenweiser's articles in this journal, will, of course, invite their friends to "listen in."

The Evolution Issue

By A. DUY MCNAIR

There has been much controversy over the subject of evolution for several years during which time two states have passed laws against the teaching of evolution in state supported schools. In many other states the laws met defeat but a new phase of the subject opens with the referendum which will be held on the subject in Arkansas in the elections of November next. If, in that election, the anti-evolutionists win it will give a great impetus to the movement in other states but if it should fail it is likely to put a quietus on the whole movement. In either case the public will learn much that is new to them. It is an educational opportunity that should be grasped by those who are interested in what is true in regard to this subject. The writer believes in the doctrine of evolution and thinks that its acceptance will mean much in furthering the progress of men. He puts, herewith, in parallel columns what he considers the attitudes of evolutionists and anti-evolutionists on the general subject.

* * *

THE EVOLUTIONISTS	THE ANTI-EVOLUTIONISTS
Do not ask for a law requiring the teaching of evolution.	Ask for a law to prevent the teaching of evolution.
Are willing to leave the matter to the intelligence and good sense of teachers, school principals, college presidents, etc.	Are not willing to leave it to the intelligence and good sense of these people.
Believe that this matter is not a proper subject for legislative action — that it should be left to the judgment of those who are well posted on the subject.	Believe that it is a proper subject for legislation — that legislatures or referendums must protect the schools from their natural leaders.
Believe in freedom of speech, freedom of research and freedom of teaching even though it modifies preconceived opinions.	Are not in favor of freedom of teaching when it treads on the toes of their preconceived opinions on theology.
Do not tell researchers in advance what conclusions they must come to.	Tell researchers in advance that their conclusions must agree with theology.
Believe that all plants and animals have descended from one or a few forms of life by reason of variations that occur century after century. They believe that plant and animal life are not rigid but are modifiable to almost any extent provided enough time is given.	Believe that each "species" was created separately in the beginning and that any modification cannot pass the limits of the species. They believe that varieties occur within the species but cannot transcend the species.
Affirm that any law that prevents teachers from teaching what they actually believe encourages insincerity and hypocrisy and thus hurts both teacher and pupils.	Do not seem to recognize the encouragement of insincerity that would result from such a law nor the tendency to make a mere "rubber stamp" of the teacher.
Believe that all questions of biology, geology, astronomy and other sciences should be decided on the basis of evidence irrespective of theological bias.	Believe that their theological standards should be the standards of secular teaching in the sciences.
Believe that an anti-evolution law would be an entering wedge toward the union of Church and State.	Deny that an anti-evolution law tends toward a union of Church and State.
Affirm that the differences between races of men such as the white races, Chinese, Negro, etc., have required hundreds of thousands of years and possibly a million years to develop.	Affirm that the differences between races of men have developed in 5000 years or thereabouts since the time of Noah. They really believe, therefore, in fast evolution but they do not know it.
Have developed new species artificially which breed true to new characteristics.	Deny that new species have been developed.

BECOME A SHARE-HOLDER

The EVOLUTION PUBLISHING CORPORATION, organized under New York State laws, offers its $10.00 shares of 6% preferred stock. With every five shares of preferred one $10.00 share of common, voting stock will be given.

The immediate business is publishing this journal, EVOLUTION and selling books. Later a Lyceum Bureau for touring natural science lecturers will be developed.

Although it is expected the business will pay, share-holders are not invited on the basis of making profits, but because this work is WORTH DOING.

Additional capital furnished now will help make the circulation campaign for EVOLUTION magazine a success. Checks should be made payable to EVOLUTION PUBLISHING CORPORATION. In remitting kindly state whether payment is made in full, or whether it should be applied on a larger block of stock to be held until balance is paid.

LET US MAIL SAMPLES TO YOUR FRIENDS

Of course you'll show this issue of EVOLUTION to your friends and ask them to subscribe. But you probably know some who would be interested, whom you can not visit yourself. Send us their names and addresses and we'll mail them sample copies.

It will cost us about five cents a copy to send out these samples, so if you can send along a check to help pay for them we'll not object. However, if your bank account is minus don't let that stop you. Send us the names anyway and we'll raise the cash otherwise.

WHAT'S A HUNTER WITHOUT AMMUNITION?

A hunter without ammunition is in the same fix as an evolutionist without copies of EVOLUTION. Surely YOU don't want to remain in such a pickle. The best way out is for you to fill in appropriate characters on the following blank in a hurry.

— — — — — — — — —

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Send me a bundle of ____ copies of EVOLUTION every month for one year. (Rate: five or more, 50c each per year)

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Number _____

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State _____

CREATION BY EVOLUTION: Edited by Frances Mason, The Macmillan Co. New York, 1928. $5.00.

An excellent book, this, with a misleading title, for what is meant is not that Evolution was the method of procedure chosen by the creator—and the title suggests this meaning — but that the process of evolution is creative.

The list of contributors is unusually impressive. President Osborn of the American Museum of Natural History, to whom we owe a most suggestive demonstration (facts at hand) of the evolution of the horse, opens the procession. He is followed by Sir Charles Sherrington, the eminent physiologist, who contributes an introduction. David Starr Jordan, late president of Leland Stanford, than whom no one knows more about the evolution of fishes, writes about the general meaning of evolution. "Why we must be evolutionists" is explained by that tireless popularizer, J. Arthur Thomson. Herbert S. Jennings, eminent protozoologist of Johns Hopkins, has some fascinating tales to tell about evolution as it can actually be seen in the laboratory. Evidences of evolution are approached from many angles: as gleaned from vestigial organs (Parker), as shown by the development of the individual organism (MacBride), as demonstrated in embryology (Conklin), as written in the record of rocks (Bather), as suggested by the geographical distribution of animals (Scott), as told by fossil plants (Berry).

In an unsually clear exposition John W. Gregory of the University of Glasgow explains what a species really is.

There is a general article on the evolution of life (Woodward, one on the evolution of plants (Jaeger), one each on the evolution of butterflies and moths (Poulton), of bees (Shipley), of ants (Wheeler), of the horse (Loomis), of birds (Watson).

The missing link is not forgotten, and its significance is commented upon by Richard S. Lull of Yale.

Professor Wm. K. Gregory of Columbia discourses on "The Lineage of Man", a subject he has made his own.

Apes deserve a place of honor in such a treatise and it is accorded them by their friend and explorer, Professor Holmes of the University of California.

G. Elliot Smith, whose ethnological vagaries have of late almost obliterated the recognition of his eminence as an anatomist, writes of the evolution of the brain.

Progress as exhibited by evolution is discussed by Julian Huxley, the versatile grandson of a great grandfather. The evolution of mind is shown by the veteran bio-psychologist, C. Lloyd Morgan. H. H. Newman, finally, of the University of Chicago, sums up the case for evolution. And a good case it is, none the less so for the honest admission by most of the contributors that here as elsewhere the widening disk of knowledge reveals the mistifying darkness around the periphery. This is as it should be, for if we knew it all, the luring light of inquiry would be blown out forever.

Alexander Goldenweiser

Evolution

By Langdon Smith

When you were a tadpole and I was a fish,
In the Paleozoic time,
And side by side on the ebbing tide
We sprawled through the ooze and slime,
Or skittered with many a caudal flip
Through the depths of the Cambrian fen.
My heart was rife with the joy of life,
For I loved you even then.

Mindless we lived, and mindless we loved,
And mindless at last we died,
And deep in a rift of Carodoc drift
We slumbered side by side.
The world turned on in the lathe of time,
And hot lands heaved amain,
Till we caught our breath from the womb of death
And crept into life again.

We were Amphibians, scaled and tailed,
And drab as a dead man's hand;
We coiled at ease neath the dripping trees,
Or trailed through the mud and sand,
Croaking and blind, with our three-clawed hand,
Writing a language dumb,
With never a spark in the empty dark
To hint at a life to come.

Yet happy we lived and happy we loved,
And happy we died once more;
Our forms were rolled in the clinging mud
Of a Neocomian shore.
The eons came and the eons fled,
And the sleep that wrapped us fast
Was riven away in a newer day,
And the night of death was past.

Then light and soft through the jungle trees
We swung our airy flights,
Or breathed in the balms of the fronded palms
In the hush of the moonless nights.
And, oh, what beautiful years were these,
When our hearts clung each to each,
When life was filled, and our senses thrilled
In the first faint dawn of speech.

Thus life by life and love by love,
We passed through the cycles strange,
And breath by breath, and death by death,
We followed the chain of change,
Till there came a time in the law of life
When over the nursing sod
The shadows broke and the soul awoke
In a strange dim dream of God.

I was thewed like an Auroch bull,
And tusked like a great cave-bear;
And you, my sweet, from head to feet,
Were gowned in glorious hair.
Deep in the gloom of a fireless cave,
When the night fell o'er the plain,
And the moon hung red o'er the river bed,
We mumbled the bones of the slain.

I flaked a flint to a cutting edge,
And shaped it with brutish craft;
I broke a shank from the woodland dank
And fitted it, head and haft,
Then I hid me close to the reedy tarn,
Where the Mammoth came to drink—
Through brawn and bone I drove the stone
And slew him on the brink.

Loud I howled through the moonlit wastes,
Loud answered our kith and kin;
From west and east to the crimson feast
The clan came trooping in.
O'er joint and gristle and padded hoof,
They fought and clawed and tore,
And cheek by jowl, with many a growl,
They talked the marvel o'er.

I carved the fight on a reindeer bone,
With rude and hairy hand;
I pictured his fall on the cavern wall
That men might understand.
For we lived by blood and the right of might,
Ere human laws were drawn,
And the age of sin did not begin
Till our brutish tusks were gone.

And that was a million years ago
In a time that no man knows;
Yet here tonight in the mellow light,
We sit at Delmonico's,
Your eyes are deep as the Devon Springs,
Your hair is as dark as jet;
Your years are few, your life is new,
Your soul untried, and yet—

Our trail is on the Kimmeridge clay,
And the scarp of the Purbeck flags;
We have left our bones on the Bagshop stones,
And deep in the Coraline crags,
Our love is old, our lives are old,
And death shall come amain.
Should it come today, what man may say
We shall not live again?

Nature wrought our souls from the Tremadoc beds
And furnished them with wings to fly;
She sowed our spawn in the world's dim dawn,
And I know it shall not die;
Though cities have sprung above the graves
Where the crook-boned men made war,
And ox-wain creaks o'er the buried caves
Where the mummied mammoths are.

Then as we linger at luncheon here,
O'er many a dainty dish,
Let us drink to the time when you
Were a tadpole and I was a fish.

(This Poem, in leaflet form, 4 pages, to fit small envelope, sent postpaid at $1.00 *per* 100; $5.00 *per* 1000. *Order from EVOLUTION, 96 Fifth Avenue, New York City)*

THE ORIGIN OF SPECIES. By Charles Darwin, E. P. Dutton & Co., New York,

Nearly seventy years after its first publication *The Origin of Species* still bears reviewing, for in no sense is it just a book of the past. Sir Arthur Keith has written such a splendid introduction to this reprint of the sixth (Darwin's last) edition and has so well stated its past influence and present standing, that I choose merely to quote.

"Its preparation occupied, from first to last, a period of forty years . . . The book came into being during a period when Europe was in a state of intense intellectual activity, and the effect it produced was immediate and profound. The generation which felt its first shock is dying or dead. . . . Having served its day and generation is it now dead? Or does it possess, within itself, the seeds of eternal youth and is it thus destined to become one of the world's perpetual possessions? The latter, I am convinced, is its destiny. On the foundations laid by Darwin in this book his successors have erected a huge superstructure which will be infinitely extended and modified as time goes on. Yet I feel certain that as long as men and women desire to know something of the world into which they have been born, they will return, generation after generation, to drink the waters of evolutionary truth at the fountain-head. . . .

"It was much more than a mere demonstration of the action of natural selection, it was the first complete demonstration that the law of evolution holds true for every form of living thing. It was this book which first convinced the world of thoughtful men and women that the law of evolution is true. . . . Nor has it finished its appointed mission. No book has yet appeared that can replace it; *The Origin of Species* is still the book which contains the most complete demonstration that the law of evolution is true. . . .

"Suppose, for a moment that an omniscient biologist, greatly daring, were to re-edit this classic—would he find much that needed alteration? Scarcely a single fact would have to be withdrawn; so accurate was Darwin in making his own observations and so careful was he in the selection of his authorities, that the modern reader may accept all his statements of fact without question. But what of his "mode" or method of evolution? The machinery involved—is it out of date? My deliberate opinion is that the machinery of evolution described in this book is not out of date and never wil be. . . .

"Far be it from me to say that *The Origin of Species* is an easy book to read. . . . What is the reason of this difficulty? It is not the style; this is simple and clear; it is not the terms used; Darwin never employs a technical word when a plain one is possible; it is not due to abstract thinking; Darwin clings always to the tangible or visible. The real explanation is its condensation; so much is packed into every sentence and every paragraph that the reader's mind becomes satiated unless he proceeds slowly and keeps his understanding busy. . . . Few men have taken out of this book all that is in it." A. S. B.

"THE DOGMA OF EVOLUTION" by L. T. More, Princeton University Press,

Professor More is Dean of the Graduate School of Cincinnati, and a physicist of standing. It might seem that such an author would not belong among the obscurantists; but his general spirit, places him with O'Toole and Price. He grudgingly accepts a general belief in evolution, but he states that "evolution of man from the lower animals . . . is purely a matter of guess." He also attacks the validity of the method and scientific spirit of Darwin and other evolutionists and biologists (Lamarck excepted).

Dr. More seems completely ignorant of any advances in the fields of biology and geology during the present century. Particularly astounding is his complete innocence in regard to genetics, his calling the inoffensive unicellular amoeba "an aggregate of cells," his discovery that the first word in the scientific name of an organism represents the order, his ignorance as to the source of food of plants, and his ignorance (or misrepresentation) of the evidence from fossils.

Darwin and Huxley, the two outstanding examples of scientific integrity, he accuses by implication of intellectual dishonesty. This would come with better grace if Dr. More did not himself mislead by mangled quotations from (among others) Darwin and Huxley.

Quotations illustrating Dr. More's inadequacies could be multiplied to almost any extent. "And it is quite safe to say that today in spite of an immensely increased collection of fossils, the positive evidence of geology, considering the vastness and intricacy of the problem of evolution, is as incomplete as it was in the time of Darwin and Huxley." It is quite safe to say that this statement, if it means anything at all (observe the weasel words), is directly contrary to fact. "In the popular mind 'the missing link' has become identified with the hope of finding the bones of some wretched, filthy being which could not be called a monkey and which no one would be willing to call a man. It is, perhaps, an odd fact that the ancestors of animals are presented to us by evolutionists as other animals well fitted to thrive in their environment and adapted to enjoy life; only in the case of man, do we get the picture of inefficiency, half man, half monkey, which is indecent and degraded." Without further comment this passage is sufficient evidence of his emotional bias, loose reasoning and lack of acquaintance with his subject.

Dean More is a special pleader, trying to prove a faith rather than uncover the truth, assuming to write with competency in a field in which his equipment is scanty and antiquated.

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"The giving up of witchcraft is in effect the giving up of the Bible." John Wesley, quoted by Andrew D. White.

"Is there any one so senseless as to believe that there are men whose footsteps are higher than their heads? . . . that the crops and trees grow downward? . . . that the rains and snow and hail fall upward toward the earth? . . . I am at a loss what to say of those who, when they have once erred, steadily persevere in their folly and defend one vain thing by another." St. Gregory Nazianzen, (referring to people on the other hemisphere).

"I've been grossly misquoted. I never did say that there was an edge to the world. There's a high wall around it, as a matter of fact, a wall thousands of feet high, beyond which the good Lord has never seen fit to cast light and sunshine. It's highly possible that the dirigible Italia has slipped over that wall. If it has, it will never come back, you may be sure of that. Byrd had better look out. If he goes over that wall, we'll never see him again either." Wilbur Glen Voliva, High Priest of Zion City, quoted by Herald Tribune.

"I am in accord with the theory (of evolution) if it means the development and growth of man under God, but not if it means he sprang from the dust by pure atomic accident and is now just an ape running around in underwear." Rev. Dr. Ambrose Bailey, First Baptist Church, Seattle.

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It will require a fund of $5,000.00 for circulation campaigns to put EVOLUTION on a self-sustaining basis, according to results already achieved. However, this is not all needed at once. Five hundred a month will do the trick. And since no "angel" or special interest backs this paper we appeal to those that approve its work for the necessary funds. Full value in shares, subscriptions or copies of the paper will be given for every dollar received.

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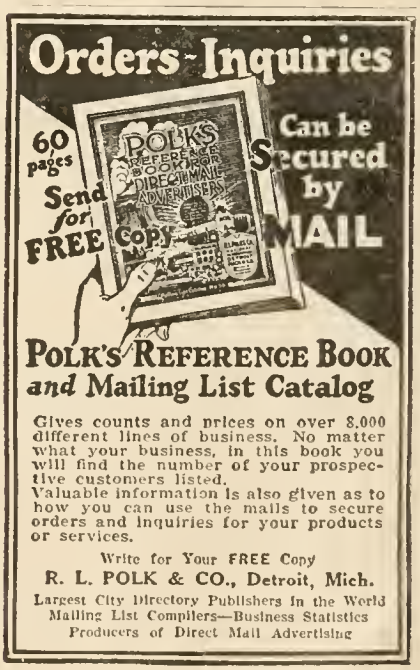

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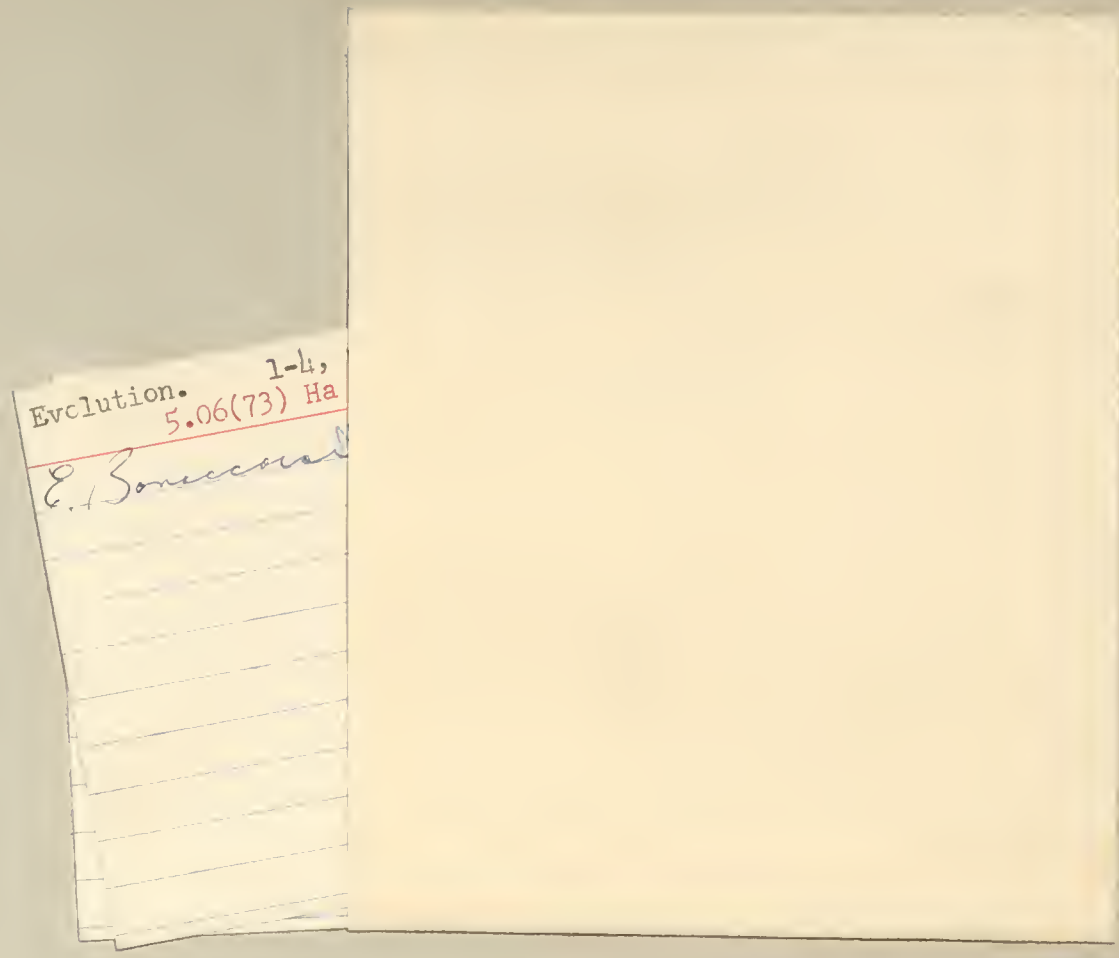

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